

What is Claimed:

- 1 1. An electron sensing device comprising
2 a cathode for providing a source of electrons, and
3 an anode disposed opposite to the cathode for receiving electrons
4 emitted from the cathode,
5 wherein the anode includes a textured surface for reducing halo in the
6 output signal of the electron sensing device.
- 1 2. The electron sensing device of claim 1 wherein
2 the textured surface includes a plurality of pits formed in the anode.
- 1 3. The electron sensing device of claim 2 wherein
2 a pit of the plurality of pits is shaped as a well having a top opening
3 formed by longitudinal walls in the anode, and
4 a bottom surface of the well is disposed longitudinally further from the
5 cathode than the top opening.
- 1 4. The electron sensing device of claim 3 wherein

2 the top opening of the well is substantially a square opening and the
3 bottom surface of the well is dimensionally substantially similar to the square
4 opening.

1 5. The electron sensing device of claim 2 wherein

2 the plurality of pits are transversely spaced from each other by a pitch
3 value varying from 1.0 micron to 30.0 microns, and

4 include longitudinal depths varying from a depth to pitch ratio of 0.5 to
5 a depth to pitch ratio of 2.0.

1 6. The electron sensing device of claim 5 wherein

2 the plurality of pits are spaced from each other to form an open area
3 ratio (OAR) ranging between 70% and 90% in the anode.

1 7. The electron sensing device of claim 5 wherein

2 the anode and cathode include a potential difference to provide an
3 initial energy value to the emitted electron, the energy value varying between 1 keV
4 and 20keV.

1 8. The electron sensing device of claim 2 wherein the electron
2 sensing device is one of a hybrid photodiode (HPD), an electron bombarded active
3 pixel sensor (EBAPS), an electron bombarded charge coupled diode (EBCCD), an
4 electron bombarded metal-semiconductor-metal vacuum phototube (MSMVPT), an
5 avalanche photo diode (APD) and a resistive anode.

1 9. The electron sensing device of claim 2 wherein
2 a microchannel plate (MCP) is disposed between the cathode and
3 anode.

1 10. The electron sensing device of claim 2 wherein
2 the anode is formed of semiconductor material and is free-of an anti-
3 reflection coating (ARC).

1 11. The electron sensing device of claim 2 wherein
2 the longitudinal distance between the cathode and anode is larger than
3 a pitch value of the plurality of pits transversely spaced from each other.

1 12. An electron sensing device comprising
2 a cathode for providing a source of electrons, and
3 an anode disposed opposite to the cathode for receiving electrons
4 emitted from the cathode,

5 wherein the anode includes a top surface, and

6 the top surface includes a plurality of openings, each defined by a base
7 of an inverted pyramid, for reducing halo in the output signal of the electron sensing
8 device.

1 13. The electron sensing device of claim 12 wherein
2 the base of the inverted pyramid is substantially a square at the top
3 surface of the anode, and
4 walls formed in the anode are extended from the base to form an apex
5 of the inverted pyramid, the apex disposed longitudinally further from the cathode
6 than the base of the inverted pyramid.

1 14. The electron sensing device of claim 13 wherein
2 the base of the inverted pyramid is a 6 micron square, and
3 the apex of the inverted pyramid is longitudinally disposed 4.091
4 microns from the base.

1 15. The electron sensing device of claim 12 wherein
2 the plurality of openings are transversely spaced from each other by a
3 pitch of 6.0 microns and forms an OAR ranging between 70% and 90%.

1 16. The electron sensing device of claim 12 wherein
2 the anode and cathode include a potential difference to provide an
3 initial energy value to the emitted electron, the energy value varying between 1 keV
4 and 20keV.

1 17. The electron sensing device of claim 12 wherein the electron
2 sensing device is one of a hybrid photodiode (HPD), an electron bombarded active
3 pixel sensor (EBAPS), an electron bombarded charge coupled diode (EBCCD), an
4 electron bombarded metal-semiconductor-metal vacuum phototube (MSMVPT), an
5 avalanche photo diode (APD) and a resistive anode.

1 18. The electron sensing device of claim 12 wherein

2 a microchannel plate (MCP) is disposed between the cathode and
3 anode.

1 19. The electron sensing device of claim 12 wherein

2 the anode is formed of semiconductor material and is free-of an anti-
3 reflection coating (ARC).

1 20. An electron sensing device comprising

2 a cathode for providing a source of electrons, and

3 an anode disposed opposite to the cathode for receiving electrons
4 emitted from the cathode,

5 wherein the anode includes a textured surface for reducing halo in the
6 output signal of the electron sensing device, and

7 the textured surface includes one of a plurality of pits and a plurality of
8 inverted pyramids.